BELLCOMM, INC.

SUBJECT: Provision of Command Module Engineering Mock-up at KSC - Case 330

DATE: March 20, 1967

FROM: L. G. Miller

MEMORANDUM FOR FILE

This memorandum reports the status of efforts to provide, at KSC, an engineering mock-up of the command module for flight crew, pad egress team, and recovery personnel training. The information that follows was generated during a meeting held at KSC on March 13, 1967.

Historically, the Mercury spacecraft flow at KSC permitted the use of the spacecraft for egress training. The Gemini spacecraft was used at Pad 19, but not without problems. In Apollo, there would be a schedule impact if the flight spacecraft were to be used for egress training. There has, additionally, been much reticence to expose the Apollo flight spacecraft to the rigors of such training. In the recent past, pad egress team and, to some extent, flight crew training has taken place using a Block I CM mock-up which was located at the NAA plant at Downey. This mock-up is presently located at KSC.

Use of the Downey mock-up was judged to be the most efficient available means of acquiring egress training as long as the number of personnel involved was relatively small. Recently, however, it has become apparent that the need is much greater. In fact, a close look indicates that providing an engineering mock-up of the CM at KSC is justified solely for use in egress and recovery training. Further benefits could be gained if it were to be used as a mock-up for EVA training, an engineering aid for retrofit activities, and a convenient means of evaluating "gross fit" stowage changes (i.e. C^2 F^2). This would require that the mock-up be kept up to date, but, since the engineering work is available from MSC, this would be limited to fabrication and installation costs.

Returning, then, to the requirement for egress training, the following uses are foreseen:

1. Initial training and retraining of pad egress team personnel.

2. Flight crew egress training while the astronauts are at KSC.

3. F-5 day recovery and rescue training.

4. Emergency training for all NAA pad technicians and operational personnel.

5. Emergency training for Bendix vacuum chamber personnel.

Those associated with the Emergency Egress Working Group of ALOC favor the use of a valid, engineering mock-up at KSC to attain the desired level of training. Both flight hardware and the Apollo simulator are all but eliminated because of scheduling difficulties and their susceptibility to damage if exposed to rough use.

Therefore, the EEWG will recommend that the Block I CM mock-up which is presently located at KSC be updated to reflect the configuration of the next manned Apollo command module. The construction of a wooden mock-up of the environmental chamber and adapter hood of the CM access arm will also be required. It will be proposed that scheduling for use of this mock-up package be handled by the EEWG. Detailed requirements will be submitted, in parallel, to the Apollo Launch Operations Committee and the chairman of the Egress Training and Equipment Sub-committee which was formed per Directive 8 of the KSC Apollo Program Office. It will be requested that the package be made available one month before delivery of the next manned spacecraft to KSC.

2032-LGM-gmp

L. G. Miller

Copy to
Messrs. F. B. Benjamin - NASA/MM
C. H. Bolender - NASA/MO-1
L. E. Day - NASA/MAT
J. K. Holcomb - NASA/MAO
T. A. Keegan - NASA/MA-2
J. B. Skaggs - NASA/MAP

S. T. Beddingfield - KSC/DJ-3
F. W. Horn, Jr. - KSC/DK
A. E. Morse, Jr. - KSC/DJ
R. A. Petrone - KSC/HA
C. A. Turner - KSC/GE ASD
J. C. Wootton - KSC/DB

W. W. Jaderlund - MSC/PD5

C. Bidgood
D. R. Hagner
J. J. Hibbert
W. C. Hittinger
B. T. Howard
P. R. Knaff
J. Z. Menard
I. D. Nehama
T. L. Powers
I. M. Ross
T. H. Thompson
G. B. Troussoff
R. L. Wagner
Central Files
Department 1023
Department 2032
Library